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09/586,183	06/01/2000	Paul Roller Michaelis	4366-16	5817

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EXAMINER	
STORM, DONALD L	

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2654	5

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/586,183	Applicant(s) MICHAELIS, PAUL ROLLER
	Examiner Donald L. Storm	Art Unit 2654

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 June 2000 and 08 October 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,7,10-13,17-26 and 30* is/are rejected.

7)☒ Claim(s) *5,6,8,9,14-16 and 27-29* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4*.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Information Disclosure Statement

1. A copy of the search report of the European Patent Office (paper 4) and the copies of the documents are present in the application file, and they have been considered by the Examiner.

Claim Informalities

2. Claims 5-6, 8-9, 14-16, and 27-29 are objected to as being (directly or indirectly) dependent upon a rejected base claim. See MPEP § 608.01(n)V. The claim(s) would be allowable over the prior art of record if rewritten to include all of the limitations of the base claim and any intervening claims.

3. The Applicant is advised that should claim 20 be found allowable, claim 22 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof.

The Applicant is advised that should claim 21 be found allowable, claim 23 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof.

When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Doddington

5. Claims 1, 7, 10, 11-13, 18-20, 22, and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Doddington [US Patent 4,696,039].

6. Regarding claim 1, Doddington [at abstract] describes processing a speech signal and the claimed limitations recognizable to one versed in the art as the following elements:

receiving a speech signal [at column 4, as the receiving the input voice, which is subsequently translated into meaningful input for the system];

dividing it into frames [at column 4, as transform to frames per second];

analyze a frame to determine a sound type associated with it [at column 8, lines 46-56, as make a decision whether a frame is nonsilent (speech, voiced) or silent];

modifying the frame [at column 7, line 13, as normalize the energy of each frame];

modifying it based on the sound type [at column 9, lines 15-17, as normalize energy dependent on the voicing decision].

7. Regarding claim 7, Doddington also describes:

changing a parameter in a manner that enhances intelligibility of an output signal [at column 10, line 66-column 11, line 7, as normalize energy will achieve higher throughput of intelligible speech information];

the parameter is associated with the frame [at column 7, line 13, as normalize the energy of each frame].

8. Regarding claim 10, Doddington also describes:

a computer readable medium having executable digital program instructions for the method [at column 11, lines 19-20, as software on a VAX for the embodiment].

9. Regarding claim 11, Doddington [at abstract] describes processing a speech signal and the claimed limitations recognizable to one versed in the art as the following elements:

providing a speech signal that is divided into time based frames [at column 6, lines 44-47, as providing frames of the speech analysis];

analyzing each frame in the context of surrounding frames [at column 8, line 48-column 9, line 13, as identifying following silent frames later as not silent, reexamining preceding frames to identify as nonsilent, and considering frames after the last frame to be silent];

adjusting an amplitude of selected frames [at column 7, line 20, as normalize the energy of each frame];

adjusting an amplitude of selected frames based on a result of the analyzing [at column 7, lines 20-57, as the energy of the frame currently being taken will be normalized with respect to following high-energy periods and preceding voiced frames].

10. Regarding claim 12, Doddington also describes:

adjusting the amplitude in a manner that enhances intelligibility of an output signal [at column 10, line 66-column 11, line 7, as normalize energy will achieve higher throughput of intelligible speech information];

it is the amplitude of a frame that is adjusted [at column 7, line 13, as normalize the energy of each frame].

11. Regarding claim 13, Doddington also describes:

determining a sound type associated with a frame [at column 8, lines 46-56, as make a decision whether a frame is nonsilent (speech, voiced) or silent].

12. Regarding claim 18, Doddington also describes:

a computer readable medium having executable digital program instructions for the method [at column 11, lines 19-20, as software on a VAX for the embodiment].

13. Regarding claim 19, Doddington [at abstract] describes a system for processing a speech signal and the claimed limitations recognizable to one versed in the art as the following elements:

means for receiving a speech signal [see Fig. 5, items 16, 18, 20, 24, 22, and their descriptions especially at columns 6-9 of processing frames of the speech analysis];

the speech signal is divided into time-based frames [at column 6, lines 44-47, as frames of the speech analysis];

means for determining a sound type associated with each frame [see Fig. 5, items 16, 18, 20, 24, 22, and their descriptions especially at column 8, lines 46-56, for making a decision whether a frame is nonsilent (speech, voiced) or silent];

means for modifying selected frames [see Fig. 5, items 16, 18, 20, 24, 22, and their descriptions especially at column 7, line 13, for normalizing the energy of each frame];

modifying it based on the sound type [at column 9, lines 15-17, as normalize energy dependent on the voicing decision];

modifying is to enhance signal intelligibility [at column 10, line 66-column 11, line 7, as normalize energy will achieve higher throughput of intelligible speech information];

14. Regarding claim 20, Doddington also describes:

implementation in a LPC encoder [at column 5, line 61-column 6, line 15, as encode in LPC formulation].

15. Regarding claim 22, Doddington also describes:

implementation in a LPC encoder [at column 5, line 61-column 6, line 15, as encode in LPC formulation].

16. Regarding claim 26, Doddington also describes:

means for ascertaining whether a frame includes a voiced or unvoiced sound [see Fig. 5, items 16, 18, 20, 24, 22, and their descriptions especially at column 8, lines 46-56, for making a decision whether a frame is nonsilent (speech, voiced) or silent].

Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Doddington and Bordeaux

18. Claims 2-4, 17, 24-25, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doddington [US Patent 4,696,039] in view of Bordeaux [US Patent 4,852,170].

19. Regarding claim 2, Doddington [at columns 5-6] describes that there are alternative parameters to LPC coding parameters for speech encoding and synthesis that may be provided to the subsequent processing, including transform techniques. However, Doddington does not further describe transform parameters. In particular, Doddington does not explicitly describe determining the spectral content of a frame.

Bordeaux [at column 11, lines 6-20] also describes speech encoding and synthesis, and Bordeaux describes:

performing spectral analysis on the frame to determine its spectral content [at column 4, lines 4-31, as analyzing the signal over a time interval to produce a spectrum].

Bordeaux [at column 2, lines 1-59] points out that the frequency characteristics of speech allow determination of the classes of phonemes and of the phonemes themselves, which in turn allows efficient recording, storage, and retrieval of the minimum parameters needed to describe speech. With the similarities of processing and applications between Doddington and Bordeaux, it would have been obvious to one of ordinary skill in the art of speech analysis and synthesis at the time of invention to follow Doddington's suggestion of other speech parameters to include Bordeaux's concept of describing the speech by spectral content to determine the classes of speech sounds because Bordeaux's phonemes provide efficient coding and synthesis of continuous speech for arbitrary speakers.

20. Regarding claim 3, Bordeaux also describes:

examining the spectral content to determine whether the frame includes a voiced or unvoiced sound [see column 9, lines 24-60, as frequencies and formants used for testing voiced and unvoiced stops].

21. Regarding claim 4, Doddington does not explicitly describe comparing amplitudes of a frame and previous frame to determine plosives.

Doddington [at columns 7-8] applies both an high-energy criterion and a voiced criterion to refine speech signal determination, and then reexamines buffered frames to further refine the criterion because the known variations across phonemes that characterize speech include variations in both criteria.

Bordeaux [at column 11, lines 6-20] also describes speech encoding and synthesis, and Bordeaux [at column 2, lines 1-59] points out frequency characteristics, in addition to wideband energy and voicing of speech allow determination of the types of speech. Bordeaux describes:

amplitudes of frames [at column 8, lines 40-42, as amplitudes of the frequency spectrum indicate formants];

comparing amplitudes to previous amplitudes to determine whether the frame includes a plosive sound [at column 9, lines 56-60, as test for low frequency before wideband and test for wideband immediately after silence].

Bordeaux [at column 2, lines 1-59] points out that the frequency characteristics of speech allow determination of the classes of phonemes and of the phonemes themselves, which in turn allows efficient recording, storage, and retrieval of the minimum parameters needed to describe

speech. With the similarities of processing and applications between Doddington and Bordeaux, it would have been obvious to one of ordinary skill in the art of speech analysis and synthesis at the time of invention to add to Doddington's criteria for speech characterization to include Bordeaux's concept of comparing amplitudes of the spectra of frames to determine the classes of speech sounds because Bordeaux's classes of speech sounds lead to phonemes that provide efficient coding and synthesis of continuous speech for arbitrary speakers.

22. Regarding claim 17, Doddington does not explicitly describe comparing amplitudes of a frame and previous frame.

Doddington [at columns 7-8] applies both an high-energy criterion and a voiced criterion to refine speech signal determination, and then reexamines buffered frames to further refine the criterion because the known variations across phonemes that characterize speech include variations in both criteria.

Bordeaux [at column 11, lines 6-20] also describes speech encoding and synthesis, and Bordeaux [at column 2, lines 1-59] points out frequency characteristics, in addition to wideband energy and voicing of speech allow determination of the types of speech. Bordeaux describes:

amplitudes of frames [at column 8, lines 40-42, as amplitudes of the frequency spectrum indicate formants];

comparing amplitudes to previous amplitudes [at column 9, lines 56-60, as test for low frequency before wideband and test for wideband immediately after silence].

Bordeaux [at column 2, lines 1-59] points out that the frequency characteristics of speech allow determination of the classes of phonemes and of the phonemes themselves, which in turn allows efficient recording, storage, and retrieval of the minimum parameters needed to describe

speech. With the similarities of processing and applications between Doddington and Bordeaux, it would have been obvious to one of ordinary skill in the art of speech analysis and synthesis at the time of invention to add to Doddington's criteria for speech characterization to include Bordeaux's concept of comparing amplitudes of the spectra of frames to determine the classes of speech sounds because Bordeaux's classes of speech sounds lead to phonemes that provide efficient coding and synthesis of continuous speech for arbitrary speakers.

23. Claim 24 sets forth additional limitations similar to limitations set forth in claim 2. Doddington and Bordeaux describe and make obvious the additional limitations as indicated there. Bordeaux also describes further additional limitations as follows:

means for spectral analysis [at column 4, lines 15-16, as spectrum analyzers].

24. Regarding claim 25, Doddington does not explicitly describe comparing amplitudes of a frame and previous frame.

Doddington [at columns 7-8] applies both an high-energy criterion and a voiced criterion to refine speech signal determination, and then reexamines buffered frames to further refine the criterion because the known variations across phonemes that characterize speech include variations in both criteria.

Bordeaux [at column 11, lines 6-20] also describes speech encoding and synthesis, and Bordeaux [at column 2, lines 1-59] points out frequency characteristics, in addition to wideband energy and voicing of speech allow determination of the types of speech. Bordeaux describes:

amplitudes of frames [at column 8, lines 40-42, as amplitudes of the frequency spectrum indicate formants];

means for comparing amplitudes of adjacent frames [at column 9, lines 52-60, as the phoneme type classifier tests for wideband immediately after silence].

Bordeaux [at column 2, lines 1-59] points out that the frequency characteristics of speech allow determination of the classes of phonemes and of the phonemes themselves, which in turn allows efficient recording, storage, and retrieval of the minimum parameters needed to describe speech. With the similarities of processing and applications between Doddington and Bordeaux, it would have been obvious to one of ordinary skill in the art of speech analysis and synthesis at the time of invention to add to Doddington's criteria for speech characterization to include Bordeaux's concept of comparing amplitudes of the spectra of adjacent frames to determine the presence of an unvoiced stop speech sound because Bordeaux's classes of speech sounds lead to phonemes that provide efficient coding and synthesis of continuous speech for arbitrary speakers.

25. Regarding claim 30, Doddington does not explicitly describe determining a vowel, voiced or unvoiced fricative, or voiced or unvoiced plosive.

Doddington [at columns 7-8] applies both an high-energy criterion and a voiced criterion to refine speech signal determination, and then reexamines buffered frames to further refine the criterion because the known variations across phonemes that characterize speech include variations in both criteria.

Bordeaux [at column 11, lines 6-20] also describes speech encoding and synthesis, and Bordeaux [at column 2, lines 1-59] points out frequency characteristics, in addition to wideband energy and voicing of speech allow determination of the types of speech. Bordeaux describes:

means for determining a voiced plosive (or other type) [at column 9, lines 52-60, as the phoneme type classifier tests for a voiced stop].

Bordeaux [at column 2, lines 1-59] points out that the frequency characteristics of speech allow determination of the classes of phonemes and of the phonemes themselves, which in turn allows efficient recording, storage, and retrieval of the minimum parameters needed to describe speech. With the similarities of processing and applications between Doddington and Bordeaux, it would have been obvious to one of ordinary skill in the art of speech analysis and synthesis at the time of invention to add to Doddington's criteria for speech characterization to include Bordeaux's concept of determining the presence of an voiced stop speech sound because Bordeaux's classes of speech sounds lead to phonemes that provide efficient coding and synthesis of continuous speech for arbitrary speakers.

Doddington and Furui

26. Claims 21 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doddington [US Patent 4,696,039] in view of Sadaoki Furui, "Digital Speech Processing, Synthesis, and Recognition," Marcel Dekker, Inc., New York, 1989, pp. 191-194 and 320-322.

27. Regarding claim 21, Doddington [at columns 5-6] describes that there are various ways of encoding the LPC parameters. Furui [at page 320] points out that artisans in the speech processing field are expected to compare the trade-offs incurred in using the various speech coding algorithms.

Among the well-know speech coding algorithms, Furui describes:

a CELP encoder [at page 321, at CELP coding algorithms].

Furui sets forth CELP encoding as conventional and that choosing among coding algorithms and using them is within the ordinary skill of artisans to satisfy desired operating

characteristics. It would have been obvious to one of ordinary skill in the art of speech encoding to trade off the cost, complexity, capability, and availability of known hardware and select the desired operating characteristics to achieve the desired advantages. CELP would be one of the obvious choices for Doddington's other speech coding techniques because CELP coding provides low bit rate for naturalness in recording, storage, and retrieval for synthesized speech.

28. Claim 23 sets forth additional limitations similar to limitations set forth in claim 21. Doddington and Furui describe and make obvious the additional limitations as indicated there.

Conclusion

29. The following references here made of record are considered pertinent to applicant's disclosure:

Ozawa [US Patent 5,018,200] describes classifying frames of digital speech signals into vowels, consonants, vocality, nasals, fricatives, and plosives.

Yoshizumi et al. [US Patent 5,583,969] describes extracting speech features, identifying a plosive, and amplifying plosives to improve the intelligibility of speech.

30. Any response to this action should be mailed to:

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

or faxed to:

(703) 872-9306, (for formal communications intended for entry)

Or:

(703) 872-9306, (for informal or draft communications, and please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA (Sixth Floor, Receptionist)

31. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donald L. Storm, of Art Unit 2654, whose telephone number is (703)305-3941. The examiner can normally be reached on weekdays between 8:00 AM and 4:30 PM Eastern Time. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (703)305-9645. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office at telephone number (703)306-0377.

Donald L. Storm
Patent Examiner
Art Unit 2654

November 17, 2003